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(54) LIGHT BARRIER PROTECTION APPARATUS

(71) We, PREROVSKÉ STROJIRNY, NARODNÍ PODNIK, a Czechoslovak Corporation of Prerov, Czechoslovakia, a corporation organised and existing under the laws of the Czechoslovak Socialist Republic do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention refers to an arrangement of protecting a working object in a manufacturing machine from penetration of a foreign matter from the surroundings, by means of a visible or infrared radiation.

The recent protection of the working objects is done by a single light ray or by a few rays extending in the horizontal direction.

With a single ray the object cannot be sufficiently protected in the vertical plane. With a plurality of rays visible in the horizontal direction, it is necessary to provide as many transmitting and receiving elements as there are rays.

According to the invention there is provided an apparatus for providing a warning of an intrusive object into a protected area, the apparatus comprising infra-red or visible light transmitters of the type which produces divergent radiation and elongate receivers for infra-red or visible light respectively, the protected area having at least one rectangular region, two opposite sides of which are defined by said elongate receivers, and at two opposite corners of which are positioned said transmitters, the divergent radiation from each transmitter being directed towards the opposite receiver.

An efficient transmitting element in the arrangement according to the invention causes a reduction in the large number of the necessary transmitting elements and it as well simplifies adjustment.

In the accompanying drawing Figure 1 shows a schematic view of an arrangement of the directional transmitting 1 and elongate receiving elements 2 of the light or infra-red rays. The divergent radiation 3 from the

transmitting elements 1 are directed towards the receiving elements 2. 50

The protection network represents a rectangular section 4, limiting at the same time the whole protection area, its dimensions being A = length and B = height. 55

Figure 2 shows a protection network consisting of four sections 4, all sections representing the whole rectangular protection area of A and B dimensions.

The invention may be utilized for the protection of the attending personnel with machines where a large headroom to be protected is necessary as well as for the protection of large objects. 60

The transmitting elements may be heat radiators provided with infra-red filters and optical means for producing divergent radiation. The radiators may be operated intermittently, according to a pulse sequence or alternatively, continuously. For the receivers the photo-electric elements are used which have simple optical systems, such as photo-resistors photo/diodes and photo-transistors with corresponding evaluation circuits with the amplifier of the signal received. The evaluation part consists of the elements of transistor logic circuits where the sequence of signals arriving from the radiation source through the optics and filter of the transmitter is received by the single receivers and excites the single evaluation logic circuits and the whole logic system. In case of the penetration of a foreign object in the protected area, part of the luminous flux in the radiation network is lost and the safeguard signal locks the protected equipment or brings the warning device in operation. Reference is made to Gruenberg Handbook of Telemetry and Remote Control, 1967 New York and to Drachsel Grundlagen der elektrischen Messtechnik 1968, Berlin. 85 90

WHAT WE CLAIM IS:—

1. An apparatus for providing a warning of an intrusive object into a protected area, the apparatus comprising infra-red or visible light transmitters of the type which produces divergent radiation and elongate receivers for 95

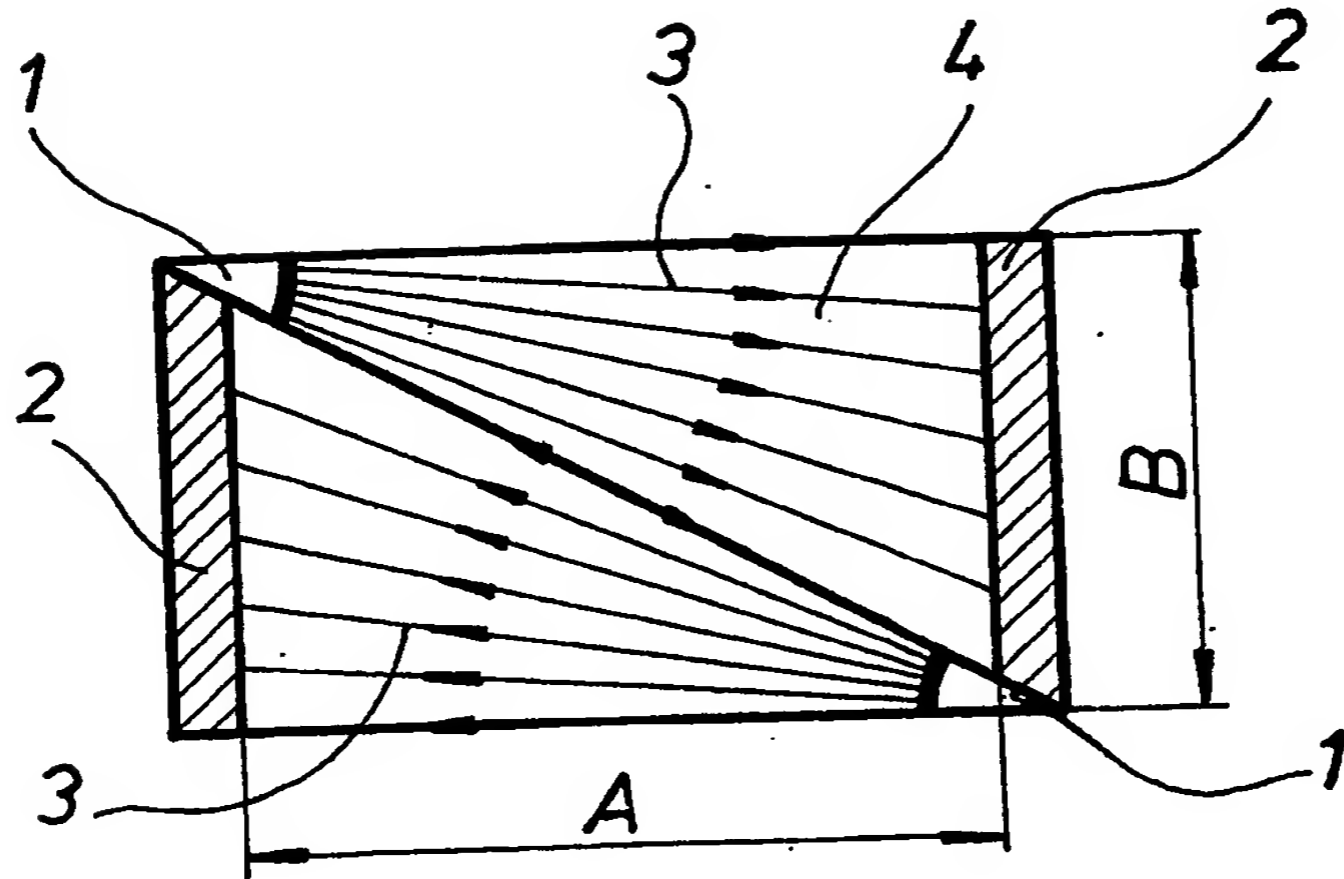
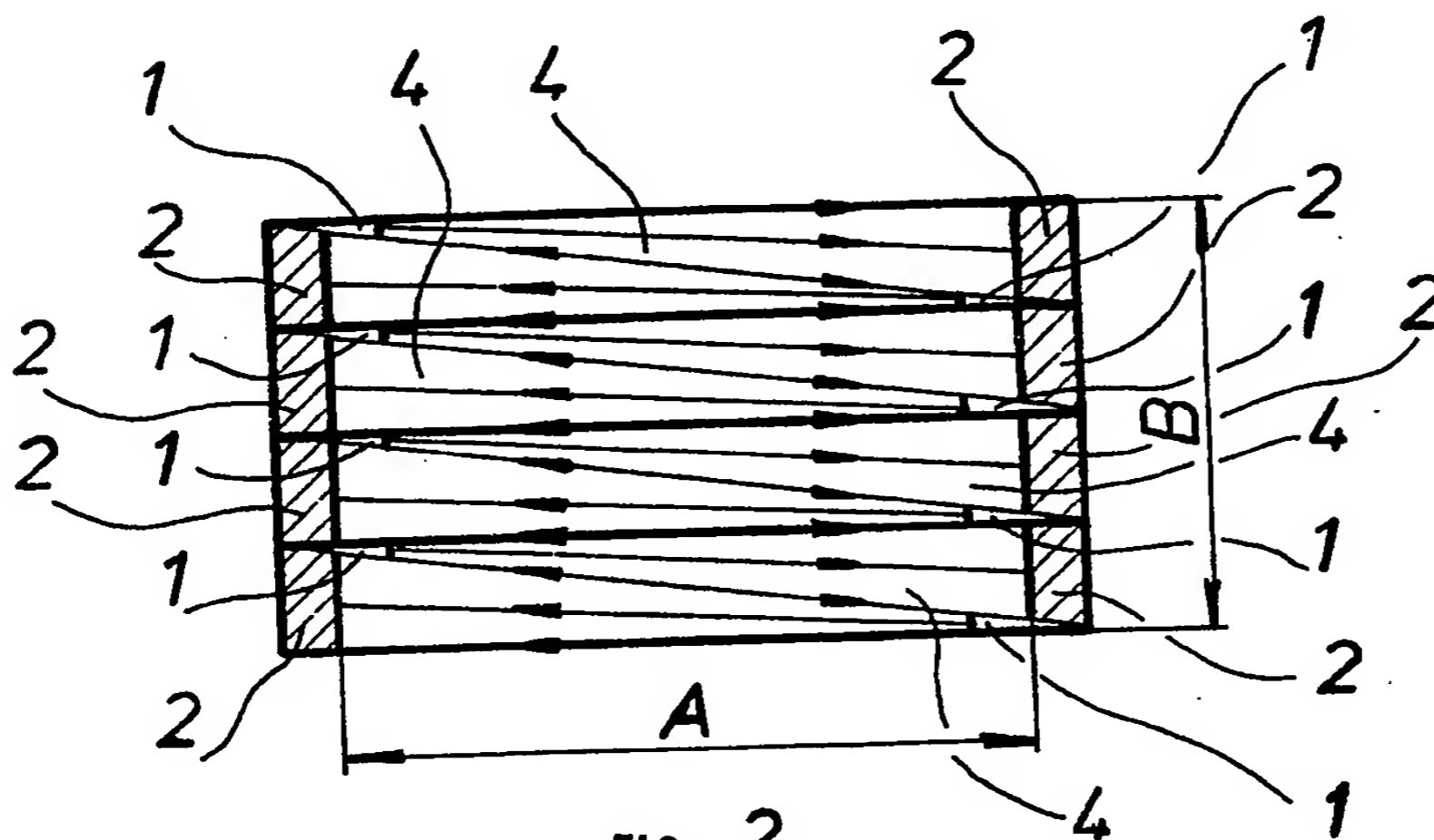
infra-red or visible light respectively, the protected area having at least one rectangular region, two opposite sides of which are defined by said elongate receivers, and at two opposite corners or which are positioned said transmitters, the divergent radiation from each transmitter being directed towards the opposite receiver.

2. An apparatus as claimed in Claim 1,
10 substantially as hereinbefore described.

3. An apparatus substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

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FIG. 1FIG. 2

**RAPPORT DE RECHERCHE
PRÉLIMINAIRE**

établi sur la base des dernières revendications
déposées avant le commencement de la recherche

N° d'enregistrement
national

FA 622178
FR 0208645

DOCUMENTS CONSIDÉRÉS COMME PERTINENTS		Revendication(s) concernée(s)	Classement attribué à l'Invention par l'INPI
Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes		
A	GB 1 561 424 A (PREROVSKE STROJIRNY NP) 20 février 1980 (1980-02-20) * page 1, ligne 26 - ligne 52; figure 1 * ---	1-7	G08B13/183 G08B5/36
A	DE 12 61 025 B (SIEMENS AG) 8 février 1968 (1968-02-08) * colonne 3, ligne 17 - colonne 4, ligne 29; figures 1,2 * -----	1-7	
			DOMAINES TECHNIQUES RECHERCHÉS (Int.CL.7)
			G08B G01V
Date d'achèvement de la recherche		Examineur	
10 mars 2003		Sgura, S	
CATÉGORIE DES DOCUMENTS CITÉS			
X : particulièrement pertinent à lui seul Y : particulièrement pertinent en combinaison avec un autre document de la même catégorie A : arrière-plan technologique O : divulgation non-écrite P : document intercalaire			
T : théorie ou principe à la base de l'invention E : document de brevet bénéficiant d'une date antérieure à la date de dépôt et qui n'a été publié qu'à cette date de dépôt ou qu'à une date postérieure. D : cité dans la demande L : cité pour d'autres raisons & : membre de la même famille, document correspondant			

ANNEXE AU RAPPORT DE RECHERCHE PRÉLIMINAIRE **RELATIF A LA DEMANDE DE BREVET FRANÇAIS NO. FR 0208645 FA 622178**

La présente annexe indique les membres de la famille de brevets relatifs aux documents brevets cités dans le rapport de recherche préliminaire visé ci-dessus.
 Les dits membres sont contenus au fichier informatique de l'Office européen des brevets à la date du 10-03-2003
 Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office européen des brevets, ni de l'Administration française

Document brevet cité au rapport de recherche		Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
GB 1561424	A	20-02-1980	CS 183859 B1	31-07-1978
			DD 131409 A1	21-06-1978
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